

WHAT IS CLAIMED IS:

C1 1. A core for a nuclear reactor comprising:

a plurality of fuel bundles; and

5 a plurality of large control rods, each said control rod comprising four control rod blades extending radially from a central portion and arranged at right angles to each other, said blades defining four fuel bundle receiving channels, said control rods arranged in a plurality of staggered rows with a plurality of fuel bundles in each said receiving channel.

10 2. A core in accordance with Claim 1 wherein said large control rods and said plurality of fuel bundles define a plurality of fuel cells, each said fuel cell comprising a large control rod and four fuel bundles in each said receiving channel of said large control rod, said plurality of fuel cells arranged so that said control rods are in a staggered row pattern where each side of each said receiving channel of a fuel cell is adjacent to, and substantially parallel to a control rod blade.

15 3. A core in accordance with Claim 1 wherein each said receiving
channel contains four fuel bundles. *C2*

4. A core in accordance with Claim 1 further comprising a top guide having a plurality of top guide beams configured to define a plurality of openings.

20 5. A core in accordance with Claim 4 further comprising a core plate spaced from said top guide, said fuel bundles extending between said top guide and said core plate.

C2 6. A core for a nuclear reactor comprising a plurality of fuel cells, each said fuel cell comprising;

25 a large control rod comprising four control rod blades extending radially from a central portion and arranged at right angles to each other, said blades

defining four quadrants of said fuel cell, each said quadrant comprising a plurality of fuel bundles;

5 said plurality of fuel cells arranged so that said control rods are in a staggered row pattern where each side of each said quadrant of a fuel cell is adjacent to a control rod blade.

7. A core in accordance with Claim 6 wherein each said fuel cell quadrant comprises four fuel bundles.

8. A core in accordance with Claim 6 further comprising a top guide having a plurality of top guide beams configured to define a plurality of openings.

9. A core in accordance with Claim 8 further comprising a core plate spaced from said top guide, said fuel bundles extending between said top guide and said core plate.

15 10 A nuclear reactor core configuration, said core comprising a plurality of fuel bundles and a plurality of large control rods, each said control rod comprising four control rod blades extending radially from a central portion and arranged at right angles to each other, said blades defining four fuel bundle receiving channels, said configuration comprising:

20 and said plurality of large fuel bundles arranged in a staggered row pattern;

 said fuel bundles arranged with a plurality of fuel bundles in each said receiving channel.

11. A nuclear reactor core configuration in accordance with Claim 10 wherein each said receiving channel contains four fuel bundles.

12. A nuclear reactor core configuration in accordance with Claim 10 wherein said core further comprises a top guide having a plurality of top guide beams configured to define a plurality of openings.

13. A nuclear reactor core configuration in accordance with Claim 12 further comprising a core plate spaced from said top guide, said fuel bundles extending between said top guide and said core plate.